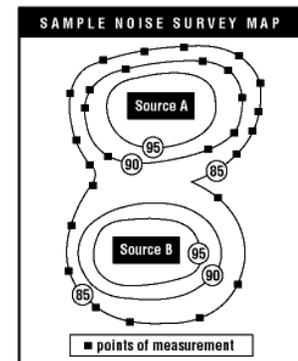


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### **1.0 Purpose/Scope**

This procedure provides a standardized method for conducting area surveys with direct reading meters. It should be used in conjunction with the SBMS Subject Area *Noise and Hearing Conservation* and an *Instrument Operation* procedure in the series IH96300-IH96699.

An area survey meter, known as a Sound Pressure Level meter (SPL) should be used to determine baseline noise levels and area noise levels. Survey meters are designed for conducting noise surveys to determine the need for area warning posting, locate problem-noise sources, and measuring the effectiveness of engineering controls. It can be used as a screening tool to determine the need for personal monitoring and to sketch isometric lines for control area delineation.

Generally, employee exposure assessments should be made with a noise dosimeter. However, an area survey meter can be used in limited situations for employee exposure assessments, such as for operations that are of short duration (15 to 30 minutes) and that involve limited employee movement so that the meter can measure the actual employee exposure. In these cases, the meter reading must be observed and recorded over the entire time of exposure.

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## 2.0 Responsibilities

- 2.1 Personnel that perform exposure monitoring with this procedure are responsible to follow all steps in this procedure.
- 2.2 The data collected using this meter must have an appropriate evaluation of the hazard and risk by a skilled Industrial Hygiene professional.

## 3.0 Definitions

- 3.1 *ACGIH*: American Conference of Governmental Industrial Hygienists
- 3.2 *Decibel (dB)*: A non-dimensional unit used to express sound pressure levels. It is the log of the ratio of the measured sound pressure level to a reference level.
  - *dBA*: A sound pressure level in decibels made on the A-scale of a sound level meter. This unit of measure approximates the response of the human ear.
  - *dBC*: Sound pressure based on a nearly flat, non-weighted scale.
- 3.3 *Fast/Slow Response*: A meter setting which electronically compensates for varying field pressure levels with simulated slow or fast “needle” inertia. Slow response is used for personal exposure monitoring. Slow response eliminates rapid fluctuation in the meter response (analog needle or digital display) to allow for a more stable reading that is easier for the operator to interpret.
- 3.4 *Frequency*: The number of cycles completed by a periodic quantity in a unit time. Unit, hertz (Hz) measures cycles per second.
- 3.5 *Impulse or Impact Noise Levels*: Variations in noise levels that involve peak levels spaced at periods of greater than one per second. Where the intervals are less than one second, it should be considered a continuous noise source.
- 3.6 *Occupational Exposure Limit (OEL)*: The maximum time weighted average (TWA) exposure permitted for employee exposure, based on the less of the OSHA Permissible Exposure Limits (PEL) or ACGIH Threshold Limit Value (TLV):

OSHA exposure levels are calculated on a 5 dB doubling rate, whereas ACGIH utilizes a 3 dB doubling rate (for each drop of 3 dB in the average noise measurement double the allowable work time).

Table A: OSHA PEL & ACGIH TLV:

Duration/Day			OSHA PEL (dBA)	ACGIH TLV (dBA)
Hours	Minutes	Seconds		
24	1440			80
16	960			82

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Duration/Day			OSHA PEL (dBA)	ACGIH TLV (dBA)
Hours	Minutes	Seconds		
8	480		90	85
4	240		95	88
2	120		100	91
1	60		105	94
½	30		110	97
¼	15		115	100
1/8	7.5			103
	3.75			106
	1.88			109
	0.94			112
		28		115
		14		118
		7.03		121
		3.52		124
		1.76		127
		0.88		130
		0.44		133
		0.22		136
		0.11		139
*No exposure to continuous or intermittent noise levels in excess of 140 dBC peak should be allowed				

## 4.0 Prerequisites

### 4.1 Steps prior to using this procedure:

- 4.1.1 Training for hazards other than noise may be needed for entry into restricted areas (check with ESH Coordinator or FS Representative for the facility).
- 4.1.2 Noise and Hearing Conservation Training and a Baseline audiogram is needed if the exposure to the person performing the survey will be in excess of the OSHA Permissible Exposure Limits (PEL) or ACGIH Threshold Limit Value (TLV), which ever is less (see Table A).

### 4.2 Area Access:

- 4.2.1 Contact the appropriate Facility Support Representative or FS Technician to obtain approval to enter radiological areas.
- 4.2.2 Verify with the appropriate Facility Support Representative or FS Technician if a *Work Permit* or *Radiological Work Permit* is needed or is in effect. If so, review and sign the permit.
- 4.2.3 Use appropriate PPE for area.

## 5.0 Precautions

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### **5.1 Hazard Determination:**

- 5.1.1 The operation of an area survey meter does not cause exposure to any chemical, physical, or radiological hazards. The meters do not generate Hazardous Waste.
- 5.1.2 By its very nature, a noise survey meter may be used in areas where excessive noise levels exist or are suspected to be present. Exposures to noise levels above the PEL and/or TLV may cause temporary or permanent hearing loss.
- 5.1.3 The meters used in this procedure are light (less than 2 pounds (1Kg)) and do not pose an ergonomic hazard.

### **5.2 Personal Protective Equipment:**

- 5.2.1 In areas where noise levels exceed the *Occupational Exposure Limit (OEL)*, hearing protection must be worn. The hearing protection should be able to reduce the noise levels below the OEL. See IH96150 Attachment 9.2 for Guidance on Hearing Protection Devices and their protection factors (Noise Reduction Ratio, NRR).
- 5.2.2 Additional PPE: Other appropriate PPE for hands, feet, skin, head, or eyes may be needed for the area being entered. Check with your FS Representative.

## **6.0 Procedure**

### **6.1 Operate the meter as per the BNL Instrument Operation SOP.**

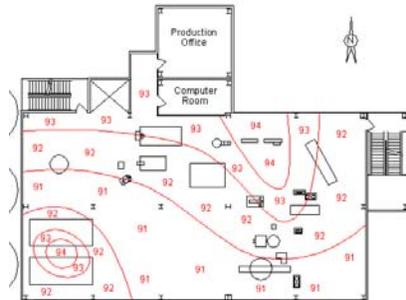
- 6.1.1 Perform a Battery Check prior to use and at least once every half hour of use.
- 6.1.2 Warm-up the meter as per the Instrument Operation SOP.
- 6.1.3 Pre-calibrate (i.e. single point operational accuracy check) the meter as per the Instrument Operation SOP. BNL requires daily calibration to a portable calibrator. Daily calibration serves as a Bump check of the meter operation pre and post testing.

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- 6.1.4 Select the desired weighting to A, B, C or FLAT (see Attachment 9.1) and the appropriate broadband weighting or octave band.
  - Employee exposure screening measurements should be taken on dBA.
  - Engineering and source characterization should be taken on dBC.
- 6.1.5 Select the desired detector response rate: FAST, IMP, PEAK, or SLOW. (Employee exposure measurements should be taken on SLOW.)
- 6.1.6 If appropriate, conduct an octave band analysis (OBA) for each frequency. OBAs are typically done for engineering measurements and are most useful if done on dBC weighting and SLOW response.

6.2 **Operator Position:** Preferably the operator should be further from the sound source than the microphone and positioned to reduce reflection of the sound to the meter. Hold the meter at arms length, not close to the body.

- 6.2.1 Do not stand between the sound source and microphone.
- 6.2.2 Do not place the hand within 12 cm (5 inches) of the microphone during measurements.
- 6.2.3 Take measurements at the employee's ear level (whether sitting, standing or bending) to estimate personal exposures and to locate isometric lines of noise intensity on a sketch for defining area levels (i.e., a plot of noise levels on the floor plan, a.k.a. isopleths).
- 6.2.4 Post-calibrate (i.e. single point operational accuracy check) the meter as per the Instrument Operation SOP.



Typical Isopleth Map

6.3 **Recording readings:**

- 6.3.1 Use a *BNL Direct Reading Sampling Instrument Form* to record readings (See Attachment 9.3).
- 6.3.2 Return meter and original sampling form to the SHSD IH Laboratory.
- 6.3.3 Ensure that a copy of any hazard evaluation report written by a competent person on the survey is sent to the IH Laboratory and the Occupational Medicine Clinic.
- 6.3.4 The IH Group will maintain a copy of sampling results for at least 75 years.

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#### 6.4 Results interpretation:

- 6.4.1 A competent person should write a hazard evaluation report that evaluates the survey data and summarizes the potential for occupational exposure and compliance with OSHA and ACGIH Occupational Exposure Limits (see Table A). See IH 60500 for more requirements on the content and reporting deadlines.
- 6.4.2 Ensure that a copy of the hazard evaluation report is sent to the IH Laboratory and is included in the ESHQ Directorate Recordkeeping system under *IH96SR*.
- 6.4.3 Ensure that a summary of any over-exposure operation is sent to the Occupational Medicine Clinic with the worker(s) BNL Life Number(s) noted.
- 6.4.4 The hazard evaluation report and/or an *Employee Notification Form* (sample in Attachment 9.3 of IH96250) must be used to inform all employees whose monitoring results indicate exposure above the OELs.

### 7.0 Implementation & Training

- 7.1 Use of this SOP and an Instrument Operation SOP for a particular meter is limited to persons who act under the direction of a competent hazard assessment person and who have demonstrated the competency to satisfactorily use the procedures and meter, as evidenced by experience and training. All persons must have met the qualification criteria set in IH50300 *BNL IH Program and IH Group Training & Qualification Matrix*.
- 7.2 Personnel are to document their training on this SOP using the Attachment 9.4 with the *Job Performance Measure Completion Certificate*. Qualification on this JPM is required on a 3 year basis, providing the professional is monitoring noise sources frequently.
- 7.3 Noise and Hearing Conservation Training and a Baseline audiogram may be needed if the exposure to the person performing the survey will be in excess of the OSHA Action Level or ACGIH Threshold Limit Value (TLV).

### 8.0 References

The only official copy is on-line at the SHSD IH Group website.  
 Before using a printed copy, verify that it is current by checking the document issue date on the website.

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- 8.1 BNL SBMS Subject Area *Noise and Hearing Conservation*
- 8.2 OSHA Noise/Hearing Conservation Standard 29CFR1910.95.
- 8.3 NIOSH Criteria for a Recommended Standard-Occupational Noise Exposure, 1998
- 8.4 ACGIH American Conference of Governmental Industrial Hygienists Threshold Limit Values for Chemical Substances and Physical Agents and Biological Exposure Indices 2004.
- 8.5 ANSI S1.13: Methods for the Measurement of Sound Pressure Levels.

## 9.0 Attachments

- 9.1 *Theory of Noise Measurements*
- 9.2 *BNL Program Administrator Guidance on Hazard Assessment and Exposure Monitoring*
- 9.3 *BNL Direct Reading Sampling Instrument Form*
- 9.4 *Job Performance Measure- Principles of Area Noise Surveys*

## 10.0 Documentation

Document Development and Revision Control Tracking		
<b>PREPARED BY:</b> <i>(Signature and date on file)</i> <b>C. Kramer; Author</b> <b>Date 02/16/01</b>	<b>REVIEWED BY:</b> <i>(Signature and date on file)</i> <b>J. Peters; SHSD IH Group</b> <b>Date 02/20/01</b>	<b>SHSD Approved By:</b> <i>(Signature and date on file)</i> <b>R. Selvey , SHSD IH Group Leader</b> <b>Date 02/22/01</b>
ESH Coordinator/ Date: <i>none</i>	Work Coordinator/ Date: <i>none</i>	SHSD Manager / Date <i>none</i>
QA Representative / Date: <i>none</i>	Training Coordinator / Date: <i>none</i>	Filing Code: <b>IH52</b>
RCD Facility Support Procedure Committee Review <b>04/10/10</b>	Environ. Compliance Rep. / Date: <i>none</i>	Effective Date: <b>02/23/01</b>
ISM Review - Hazard Categorization <input type="checkbox"/> High <input checked="" type="checkbox"/> Moderate <input type="checkbox"/> Low/Skill of the craft	Validation: <input type="checkbox"/> Formal Walkthrough <input checked="" type="checkbox"/> Desk Top Review <input type="checkbox"/> SME Review Name / Date:	Implementation: Training Completed: Tracked in BTMS Procedure posted on Web: 11/02/05 Hard Copy files updated: 11/02/05

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Revision Log		
Purpose: <input type="checkbox"/> Temporary Change <input type="checkbox"/> Change in Scope <input type="checkbox"/> Periodic review <input type="checkbox"/> Clarify/enhance procedural controls Changed resulting from: <input type="checkbox"/> Environmental impacts <input type="checkbox"/> Federal, State and/or Local requirements <input type="checkbox"/> Corrective/preventive actions to non-conformances <input type="checkbox"/> none of the above Section/page and Description of change: Renumbered IH-FP-1.2 to new system IH96200. No other changes necessary.		
R. Selvey (signature on file) 3/09/01 SME Reviewer/Date:	Reviewer/Date:	Reviewer/Date:
Purpose: <input type="checkbox"/> Temporary Change <input type="checkbox"/> Change in Scope <input type="checkbox"/> Periodic review <input checked="" type="checkbox"/> Clarify/enhance procedural controls Changed resulting from: <input type="checkbox"/> Environmental impacts <input type="checkbox"/> Federal, State and/or Local requirements <input type="checkbox"/> Corrective/preventive actions to non-conformances <input type="checkbox"/> none of the above Section/page and Description of change: Revised to include RCD Facility Support Procedure Committee Review comments.		
R. Selvey 04/11/01(Signature on file) SME Reviewer/Date:	Reviewer/Date:	Reviewer/Date:
Purpose: <input type="checkbox"/> Temporary Change <input type="checkbox"/> Change in Scope <input type="checkbox"/> Periodic review <input checked="" type="checkbox"/> Clarify/enhance procedural controls Changed resulting from: <input type="checkbox"/> Environmental impacts <input type="checkbox"/> Federal, State and/or Local requirements <input type="checkbox"/> Corrective/preventive actions to non-conformances <input type="checkbox"/> none of the above Section/page and Description of change: Added <i>Attachment 8.2: BNL Program Administrator Guidance on Hazard Assessment and Exposure Monitoring</i>		
(signature on file) 04/26/01 R. Selvey SME Reviewer/Date:	Reviewer/Date:	Reviewer/Date:
Purpose: <input type="checkbox"/> Temporary Change <input type="checkbox"/> Change in Scope <input type="checkbox"/> Periodic review <input checked="" type="checkbox"/> Clarify/enhance procedural controls Changed resulting from: <input type="checkbox"/> Environmental impacts <input type="checkbox"/> Federal, State and/or Local requirements <input type="checkbox"/> Corrective/preventive actions to non-conformances <input type="checkbox"/> none of the above Section/page and Description of change: Referred to IH96150 for NRR calculations in 5.2.1. Revised with ACGIH TLV for 24 hrs. Verified new 2001 ACGIH TLVs.		
(Signature on file) R. Selvey 05/08/01 SME Reviewer/Date:	Reviewer/Date:	Reviewer/Date:
Purpose: <input type="checkbox"/> Temporary Change <input type="checkbox"/> Change in Scope <input type="checkbox"/> Periodic review <input checked="" type="checkbox"/> Clarify/enhance procedural controls Changed resulting from: <input type="checkbox"/> Environmental impacts <input type="checkbox"/> Federal, State and/or Local requirements <input type="checkbox"/> Corrective/preventive actions to non-conformances <input type="checkbox"/> none of the above Section/page and Description of change: <b>Clarified wording on pre and post calibration to match IH51660.</b>		
(signature on file) R. Selvey 06/08/01 SME Reviewer/Date:	Reviewer/Date:	Reviewer/Date:
Purpose: <input type="checkbox"/> Temporary Change <input type="checkbox"/> Change in Scope <input checked="" type="checkbox"/> Periodic review <input checked="" type="checkbox"/> Clarify/enhance procedural controls Changed resulting from: <input type="checkbox"/> Environmental impacts <input type="checkbox"/> Federal, State and/or Local requirements <input type="checkbox"/> Corrective/preventive actions to non-conformances <input type="checkbox"/> none of the above Section/page and Description of change: Revised format in Section 7. Updated references to SBMS		
(signature on file) R. Selvey 04/09/04 SME Reviewer/Date:	Reviewer/Date:	Reviewer/Date:

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Purpose: <input type="checkbox"/> Temporary Change <input type="checkbox"/> Change in Scope <input type="checkbox"/> Periodic review <input checked="" type="checkbox"/> Clarify/enhance procedural controls Changed resulting from: <input type="checkbox"/> Environmental impacts <input type="checkbox"/> Federal, State and/or Local requirements <input type="checkbox"/> Corrective/preventive actions to non-conformances <input type="checkbox"/> none of the above Section/page and Description of change: Updated Section 7 to link to current qualification form in IH96120. Revised Attachment 9.3		
<i>(signature on file)</i> R. Selvey 07/14/04 SME Reviewer/Date:	Reviewer/Date:	Reviewer/Date:
Purpose: <input type="checkbox"/> Temporary Change <input type="checkbox"/> Change in Scope <input type="checkbox"/> Periodic review <input checked="" type="checkbox"/> Clarify/enhance procedural controls Changed resulting from: <input type="checkbox"/> Environmental impacts <input type="checkbox"/> Federal, State and/or Local requirements <input type="checkbox"/> Corrective/preventive actions to non-conformances <input checked="" type="checkbox"/> none of the above Section/page and Description of change: Revised Section 7 training requirements. Updated Section 10 to new format. Revised Attachment 9.4 Notification Form; Removed Attachment 9.5 Data Entry Form (obsolete); Added Attachment 9.5 JPM.		
<i>(signature on file)</i> R. Selvey 11/02/05 SME Reviewer/Date:	Reviewer/Date:	Reviewer/Date:
Purpose: <input type="checkbox"/> Temporary Change <input type="checkbox"/> Change in Scope <input type="checkbox"/> Periodic review <input checked="" type="checkbox"/> Clarify/enhance procedural controls Changed resulting from: <input type="checkbox"/> Environmental impacts <input type="checkbox"/> Federal, State and/or Local requirements <input type="checkbox"/> Corrective/preventive actions to non-conformances <input checked="" type="checkbox"/> none of the above Section/page and Description of change: Based on worker input for clarity, removed Attachment 9.4 Notification Form and put it in IH96250.		
<i>(signature on file)</i> R. Selvey 11/18/05 SME Reviewer/Date:	Reviewer/Date:	Reviewer/Date:
Purpose: <input type="checkbox"/> Temporary Change <input type="checkbox"/> Change in Scope <input type="checkbox"/> Periodic review <input checked="" type="checkbox"/> Clarify/enhance procedural controls Changed resulting from: <input type="checkbox"/> Environmental impacts <input type="checkbox"/> Federal, State and/or Local requirements <input type="checkbox"/> Corrective/preventive actions to non-conformances <input checked="" type="checkbox"/> none of the above Section/page and Description of change: Minor typo corrections in several sections. Added Slow/Fast response in Definitions. Modified report to OMC I 6.4.3. Corrected error in OSHA Action Level in 7.4.		
<i>(signature on file)</i> R. Selvey 02/01/06 SME Reviewer/Date:	Reviewer/Date:	Reviewer/Date:

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## Attachment 9.1

### Theory of Noise Measurements

Octave-band filters separate the noise into discrete frequency ranges typically centered from 31.5 Hz to 16 kHz in octave intervals. Separation of the noise into these frequency bands is useful in predicting the success of various forms of engineering controls and in predicting the potential harmful nature of noise to human speech frequencies.

Weighting on scales A, B, C and Flat is done to adjust the microphone characteristics to simulate the response of the human ear's response to sound (dBA) or to other response curves that are more characteristics of the true sound pressure level (dBB, dBC, and Flat). If the measured sound levels are much higher on the C-weighting than on the A-weighting, much of the noise is contributed by the low frequencies.

- *A Network*: Simulates the response of the human ear to noise. Generally used in noise surveys to locate noise hazards. The A Network discriminates against the low frequencies quite severely as does the human ear. Most regulations require that noise be measured on the A-weighting scale.
- *B Network*: Moderately discriminates against low frequencies
- *C Network*: Barely discriminates against low frequencies. Nearly a flat response.
- *Flat*: No filtering of the incoming pressure signal, i.e., a flat response.

Microphone signal decay can be set to FAST, SLOW, IMPACT and IMPULSE response. **Employee exposure is made on Slow response.** Impact is used for single bursts such as a weapon shot.

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## Attachment 9.2

### **BNL Program Administrator Guidance on Hazard Assessment and Exposure Monitoring**

**1.0 Occupational Exposure Periodic Surveys-** Periodic surveys are done to determine compliance with occupational exposure standards based on measurement of employee exposure to noise.

Assessment of high noise areas should be done with Sound Pressure Level (SPL) measuring devices including Survey Meters and/or Personal Noise Dosimeters. Selection of the appropriate type of equipment shall conform to specifications established in SHSD IH Group IH96 series SOPs and to the requirements cited in OSHA and ANSI standards.

- All equipment should be calibrated as per IH51600.
- Initial assessment should be done at the installation and start of operation or for any equipment in operation that has not been previously evaluated by measurement or analogy to existing representative equipment.
- Surveys should be re-done, optimally on an annual basis, but at no more than a three-year interval.
- Surveys should be re-done if equipment or operation changes are made that could affect the noise level.

**2.0 Source and Area Measurements-** Ambient and source noise measurement for determining high noise areas may be included in the periodic survey program. Measurements are made in suspect areas to determine the intensity, frequency, and pattern of noise to:

- Determine if excessive noise is present and annual surveys are needed,
- Determine parameters for engineering control measures.

The devices used will typically be Survey Meters and Octave Band Analyzers. Selection of the appropriate type of equipment shall conform to specifications established in SHSD IH Group IH96 series SOPs and to the requirements cited in OSHA and ANSI standards.

Ambient and source noise measurement typically need to be re-done only when equipment or operation changes are made that could affect the noise level.

**3.0 Use of Survey Meters (Broad Band) for employee exposure measurements-**

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A Survey meter can be used to determine the SPL TWA in the area for compliance monitoring, when noise levels in the area to be surveyed are:

- Uniform throughout the area,
- Constant throughout the work period, and
- Exposed personnel are not highly mobile within the workarea and remain in the area throughout the exposure period and do not enter and leave the area while performing typical work assignments.

Measurements should be made that are representative of exposure throughout the work shift by means of:

- multiple readings taken at intervals during the work day or
- datalogging.

Readings should be averaged on a time-weighted basis for the period of measurement or for the full shift as is appropriate based on the noise source.

The meter should be located at worker ear level in a placement that characterizes the worker exposure while performing typical work activities. The instrument should be operated in the A-weighted scale, on slow response.

Survey meters made also be used to take instantaneous measurements of noise pressure levels for identification of high noise areas, and for taking measurements aimed at locating noise sources. In these cases, simulation of full work shift exposure and worker exposure is not necessary.

#### 4.0 Octave Band Analyzers (OBA)-

OBAs should be used for analysis of noise sources to determine the range of frequency and pressure level in each octave range. This data is used for determining appropriate engineering control and determining the potential for damage in human speech frequencies. The OBA should be operated as a survey tool and attempts to correlate to worker exposure and duration are not mandatory.

The only official copy is on-line at the SHSD IH Group website.  
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**Attachment 9.3**  
**Sound Pressure Level Survey Form**  
(2 sided, 2 page form)

**Attachment 9.4**  
**Job Performance Measure**  
(1 page form)

**(see next pages)**

DATE:	SURVEYOR(S):
-------	--------------

I. AREA INFORMATION		
DEPT:	BLDG:	ROOM:
SOURCE:		
ENGINEERING CONTROLS:		

II. EMPLOYEE INFORMATION		
FIRST NAME:	LAST NAME:	BNL #:
DEPT:	BLDG:	JOB TITLE:
EXPOSURE DURATION (HRS):	EXPOSURE (TIMES PER DAY):	EXPOSURE (DAYS PER YR):
JOB PERFORMED:		
PPE USED:		

III. SURVEY INSTRUMENT INFORMATION												
INSTRUMENT:	MODEL:					SERIAL#:						
FACTORY CALIBRATION DATE:	PRE-CAL: BY:					POST CAL: BY:						
BATTERY CHECK (Y/N):	125	250	500	1000	2000	125	250	500	1000	2000		
CALIBRATOR SERIAL #:	dBA					dBA						
	dBC					dBC						

IV. SAMPLING INFORMATION & RESULTS					
Response: <input type="checkbox"/> FAST <input type="checkbox"/> SLOW			WIND SCREEN: Y N		
TIME	LOCATION OF SAMPLE READING	SPL READING		COMMENTS, SPECIAL CONDITIONS, and/or STATUS OF SOURCE	
		dBA	dBC		
____ Additional Data on back of form					

V. CONCLUSIONS & RECOMMENDATIONS

**IV. SAMPLING INFORMATION & RESULTS (continued)**

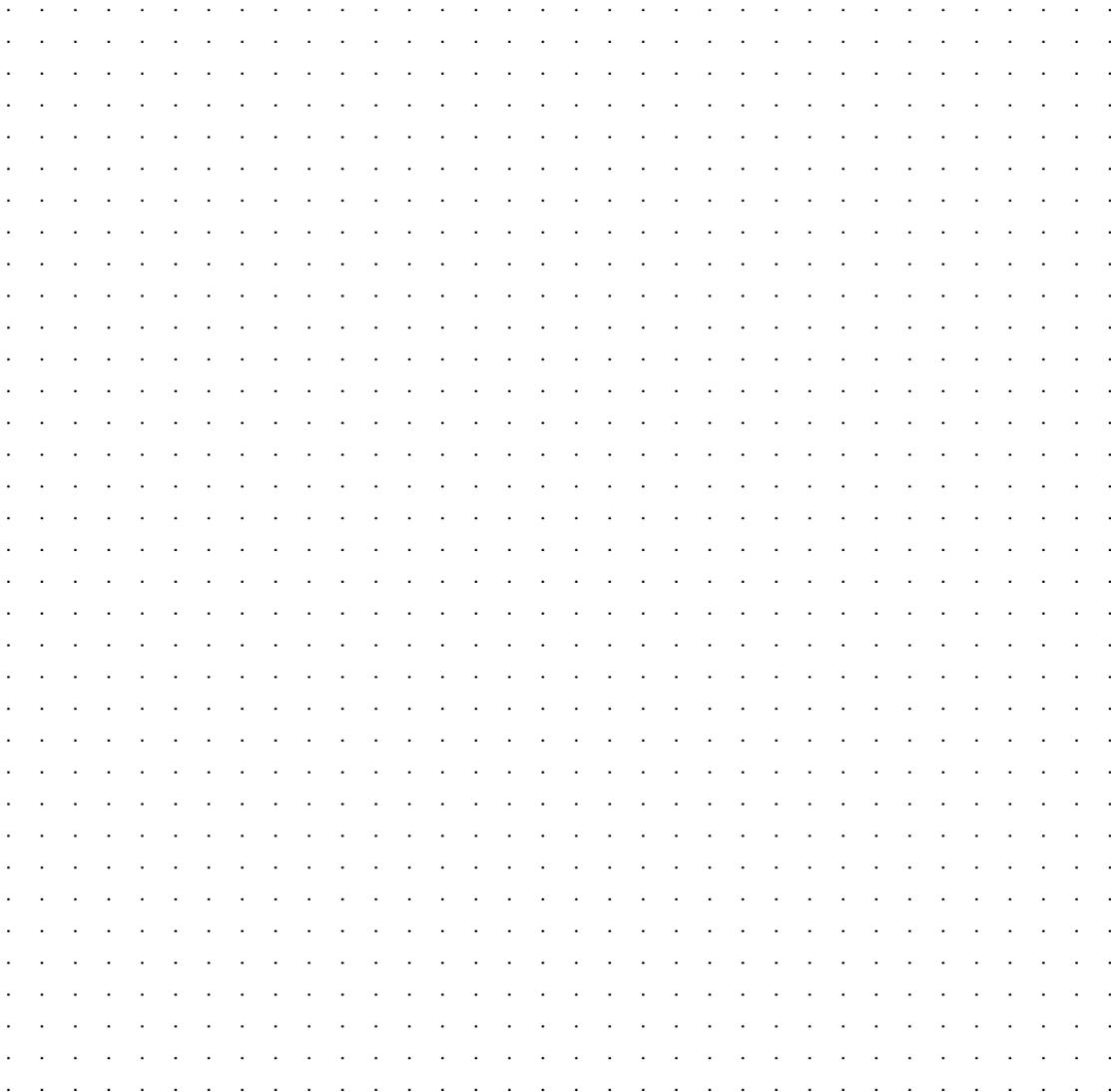
Response: \_\_\_FAST \_\_\_SLOW

WIND SCREEN: Y N

TIME	LOCATION OF SAMPLE READING	SPL READING		COMMENTS, SPECIAL CONDITIONS, and/or STATUS OF SOURCE
		dBA	dBC	

Additional Data on back of form

SKETCH OF SAMPLING AREA (OPTIONAL)





## Noise and Hearing Conservation Program Noise Area Surveys

### Job Performance Measure (JPM) Completion Certificate

Candidate's Name	Life Number:
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Criteria	Qualifying Performance Standard	Unsat.	Recov.	Satisf.
1. Hazard Analysis	Understands the need to perform a hazard analysis of the area to determine the potential exposure to the self as sampler and workers in the area.			
2. Personal Protective Equipment	Understands the need to be aware of the potential surface contamination, airborne levels of contaminants, radiological hazards, and noise hazard. Knows how to determine the need for PPE.			
3. Pre-Testing Inspection	Understands the need to verify that the system to be monitored is operational and represents typical operation. Makes notation in sampling record if the operating conditions are atypical.			
4. Conducts appropriate interviews	Demonstrates knowledge in setting up and conducting monitoring with input from supervision and workers to determine exposure characteristics. Demonstrates knowledge of a work history during sampling.			
5. Investigation techniques	Demonstrates knowledge in the various weighting factors for noise. Can name the 3 weighting factors and their characteristics.			
6. Investigation techniques	Demonstrates knowledge in mapping the area and indicating source and operator locations.			
7. Investigation techniques	Has knowledge of the various measurement techniques- area survey, octave band analysis, and dosimetry and describes the appropriate time to use each and their advantages and limitations.			
8. Documentation	Understands how to correctly fill out IH forms, transfers to IH databases, prepare an evaluation assessment report (including an evaluation of the relationship of the exposure to occupational exposure limits), and notify workers and management of the results.			

### Other Pertinent Training

Supplier	Course Title/Description	Date
<b>BNL IND TQ-Noise is to be maintained current via the BTMS.</b>		

I accept the responsibility for performing the tasks as demonstrated within this JPM and the corresponding SOP.

Candidate Signature:	Date:
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I certify the candidate has satisfactorily performed each of the above listed steps and is capable of performing the task unsupervised.

Evaluator Signature:	Date:
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